

What is Claimed is:

1. A position sensor for a medical device, the position sensor comprising:

a core made of a Wiegand effect material; and a winding circumferentially positioned around the core.

2. The position sensor according to Claim 1, wherein the position sensor is used to determine position coordinates.

3. The position sensor according to Claim 2, wherein the position sensor is also used to determine orientation coordinates.

4. The position sensor according to Claim 1, wherein the position sensor maintains accuracy of ≤ 1 mm at temperatures greater than 75°C .

5. The position sensor according to Claim 4, wherein the position sensor maintains accuracy of ≤ 1 mm at temperatures at approximately 80°C .

6. The position sensor according to Claim 1, wherein the core has an outer diameter less than approximately 0.3mm.

7. The position sensor according to Claim 6, wherein the core has an outer diameter of about 0.25mm.

8. The position sensor according to Claim 7, wherein the winding is attached to the core.

9. The position sensor according to Claim 8, wherein a combination of the core and the winding has an outer diameter less than approximately 0.5mm.

5 10. The position sensor according to Claim 9, wherein the combination of the core and the winding have an outer diameter of about 0.4 mm.

11. The position sensor according to Claim 10, wherein the material of the core comprises cobalt

10 12. The position sensor according to Claim 11, wherein the material of the core further comprises vanadium.

15 13. The position sensor according to Claim 12, wherein the material of the core further comprises iron.

14. The position sensor according to Claim 13, wherein the material of the core comprises approximately 20%-80% cobalt.

20 15. The position sensor according to Claim 13, wherein the material of the core comprises approximately 2%-20% vanadium.

16. The position sensor according to Claim 13, wherein the material of the core comprises approximately 25%-50% iron.

25 17. The position sensor according to Claim 13, wherein the material of the core comprises approximately 52% cobalt, 10% vanadium and 38% iron.

18. The position sensor according to Claim 8, wherein the winding is made of copper.

19. The position sensor according to Claim 3, wherein the position sensor has an accuracy within approximately 0.5 mm.

20. A position sensor for a medical device, the position sensor comprising:

a core made of a high permeable material, the material being a magnetic material that produces a magnetic field that switches polarity and causes a substantially uniform voltage pulse upon an application of an external field.

21. The position sensor according to Claim 20, further comprising a winding circumferentially positioned around the core.

22. The position sensor according to Claim 20, wherein the position sensor is used to determine position coordinates.

23. The position sensor according to Claim 22, wherein the position sensor is also used to determine orientation coordinates.

24. The position sensor according to Claim 20, wherein the position sensor maintains accuracy of ≤ 1 mm at temperatures greater than 75°C.

25. The position sensor according to Claim 24, wherein the position sensor maintains accuracy of ≤ 1 mm at temperatures at approximately 80°C.

26. The position sensor according to Claim 20, wherein the core has an outer diameter less than approximately 0.3mm.

27. The position sensor according to Claim 26, wherein the core has an
5 outer diameter of about 0.25mm.

28. The position sensor according to Claim 27, wherein the winding is attached to the core.

29. The position sensor according to Claim 28, wherein a combination of
10 the core and the winding has an outer diameter less than approximately 0.5mm.

30. The position sensor according to Claim 29, wherein the combination
of the core and the winding have an outer diameter of about 0.4 mm.

31. The position sensor according to Claim 30, wherein the material of
15 the core comprises cobalt.

32. The position sensor according to Claim 31, wherein the material of
20 the core further comprises vanadium.

33. The position sensor according to Claim 32, wherein the material of
the core further comprises iron.

34. The position sensor according to Claim 33, wherein the material of
25 the core comprises approximately 20%-80% cobalt.

35. The position sensor according to Claim 33, wherein the material of the core comprises approximately 2%-20% vanadium.

36. The position sensor according to Claim 33, wherein the material of the core comprises approximately 25%-50% iron.

37. The position sensor according to Claim 33, wherein the material of the core comprises approximately 52% cobalt, 10% vanadium and 38% iron.

38. The position sensor according to Claim 28, wherein the winding is made of copper.

39. The position sensor according to Claim 23, wherein the position sensor has an accuracy within approximately 0.5 mm.

40. The position sensor according to Claim 20, wherein the material of the core comprises a copper, nickel and iron alloy (CuNiFe).

41. The position sensor according to Claim 20, wherein the material of the core comprises an iron, chrome and cobalt alloy.